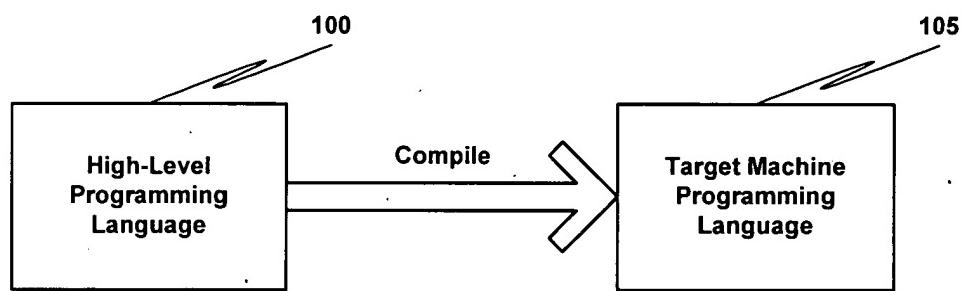
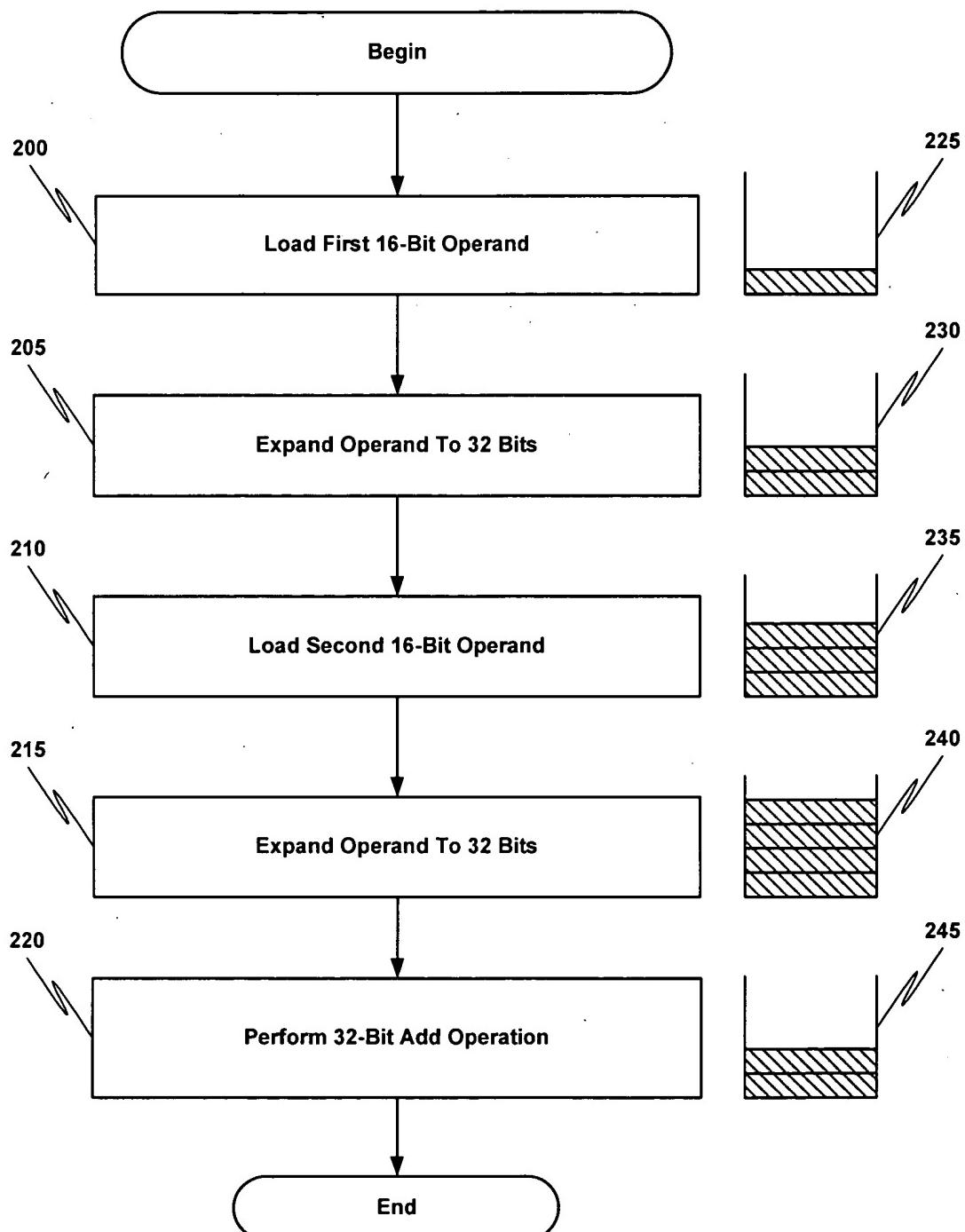


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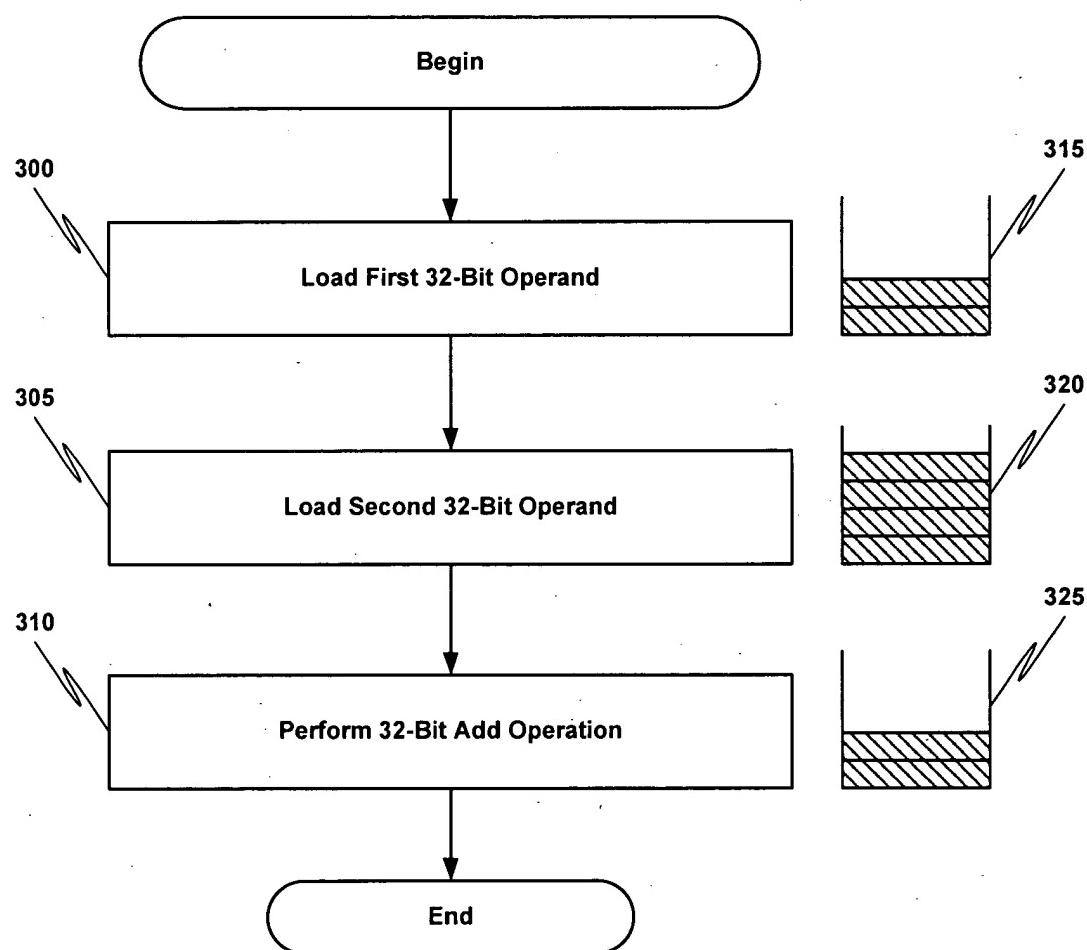
Prior Art

FIG. 1



Prior Art

FIG. 2



Prior Art

FIG. 3

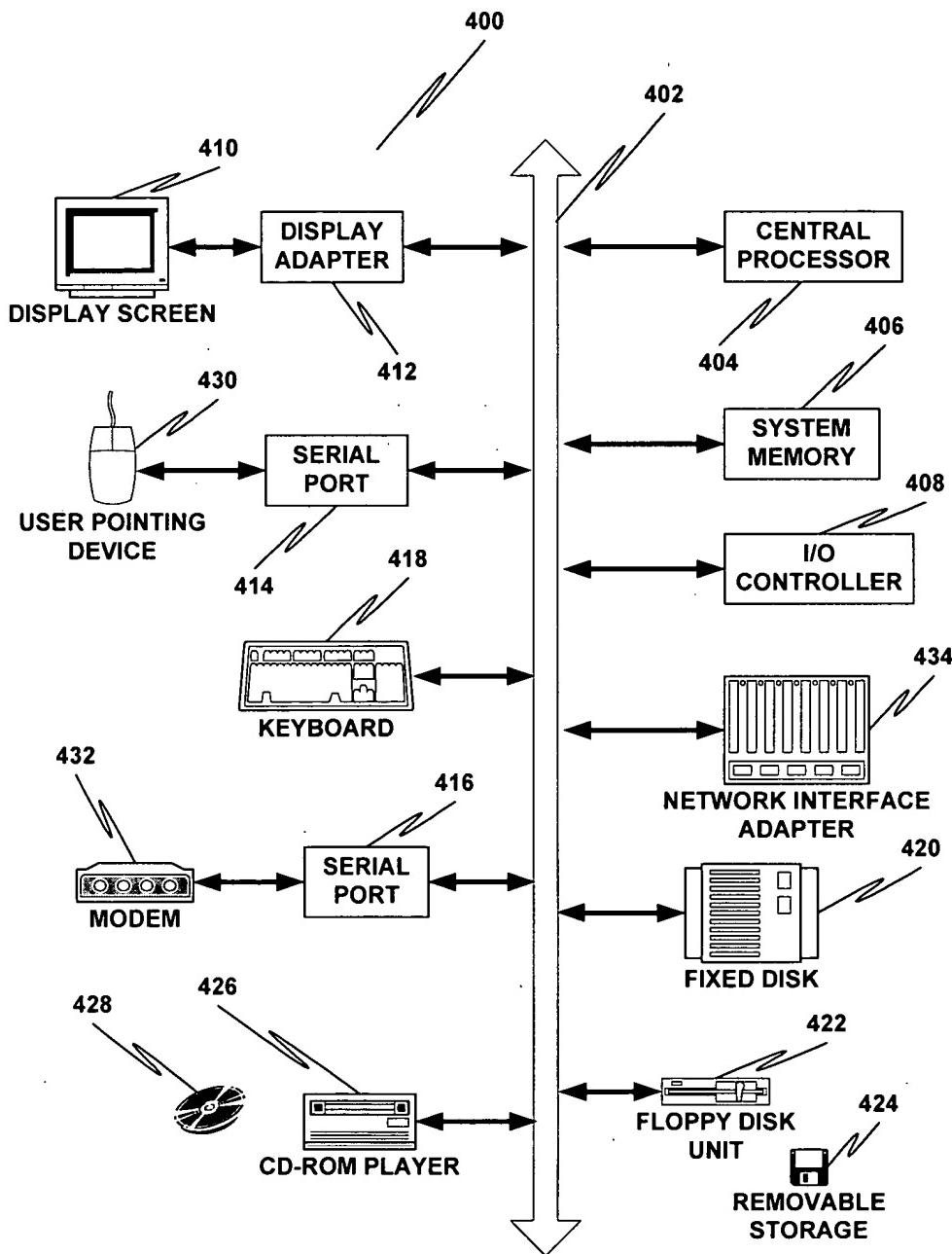


FIG. 4

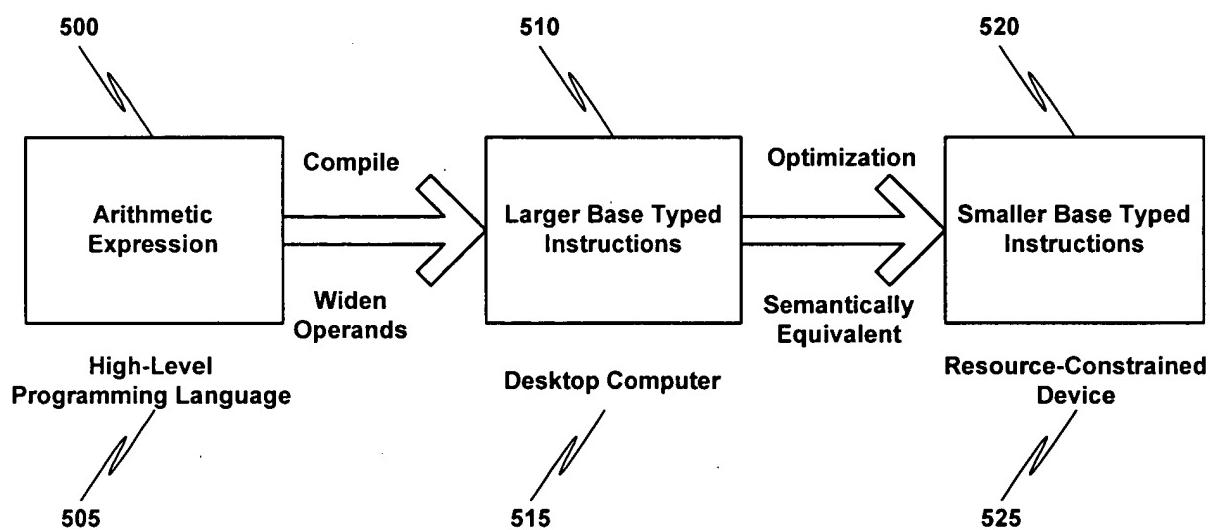


FIG. 5

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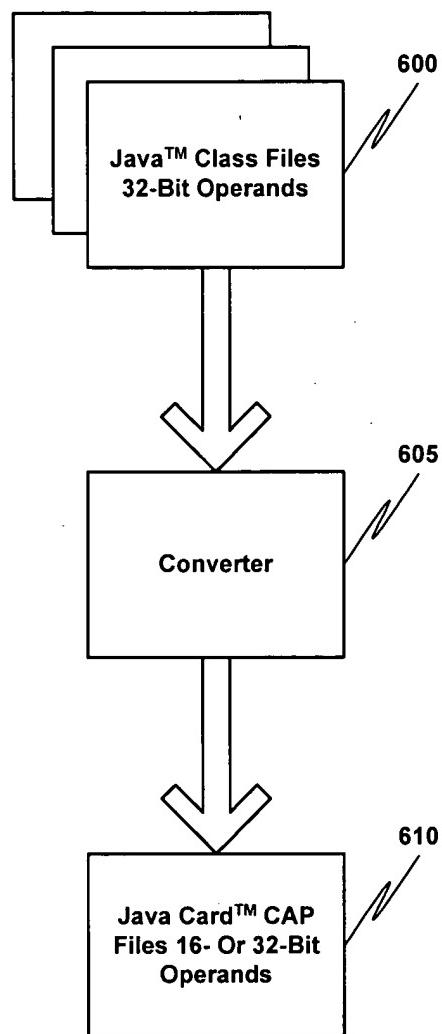


FIG. 6

Desktop Computer

```
short a = 0x7FFF;  
short b = 1;  
short c = 1;  
  
result = a [int-type add] b;  
= 0x00007FFF + 1  
= 0x00008000  
= 32768
```

FIG. 7A

Resource-Constrained Device

```
short a = 0x7FFF;  
short b = 1;  
short c = 1;  
  
result = a [short-type add] b;  
= 0x7FFF + 1  
= 0x8000  
= -32768
```

FIG. 7B

```
result = (short) a [int-type add] b;  
= (short) (0x00007FFF + 1)  
= (short) (0x00008000)  
= 0xFFFF800  
= -32768
```

FIG. 8A

```
result = (short) a [short-type add] b;  
= (short) (0x7FFF + 1)  
= (short) (0x8000)  
= -32768
```

FIG. 8B

```
result = (short) (a [int-type add] b  
[int-type add] c);  
= (short) (0x00007FFF + 1 + 1)  
= (short) (0x00008001)  
= 0xFFFF8001  
= -32767
```

FIG. 9A

```
result = (short) (a [short-type add] b  
[short-type add] c);  
= (short) (0x7FFF + 1 + 1)  
= (short) (0x8001)  
= -32767
```

FIG. 9B

```
result = a[int-type add] b  
[int-type divide] c;  
= (0x00007FFF + 1) / 2  
= 0x00008000 / 2  
= 0x00004000  
= 16384
```

FIG. 10A

```
result = a [short-type add] b  
[short-type divide] c;  
= (0x7FFF + 1) / 2  
= 0x8000 / 2  
= 0xC000  
= -16384
```

FIG. 10B

FIG. 7A-10B

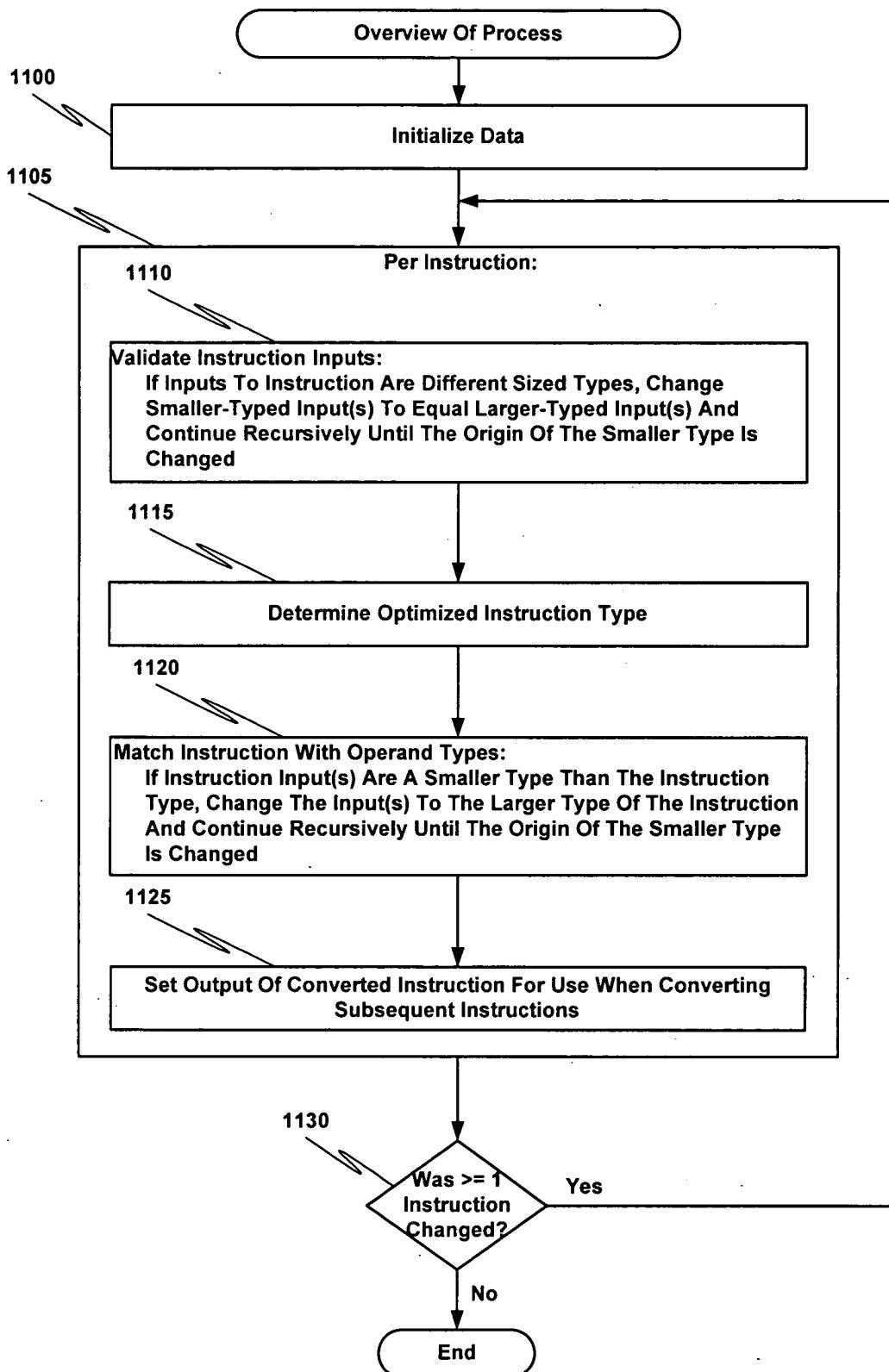


FIG. 11

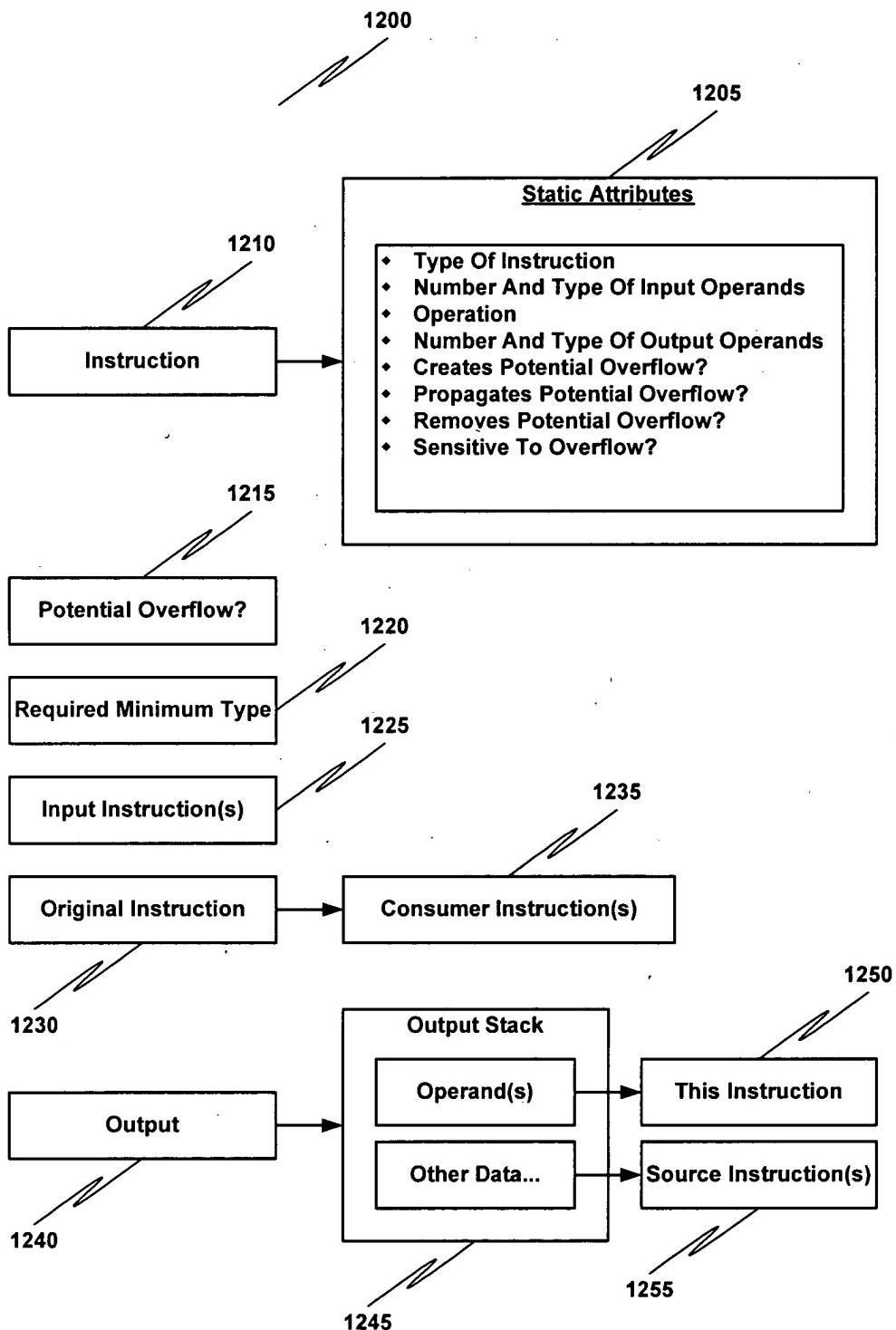


FIG. 12

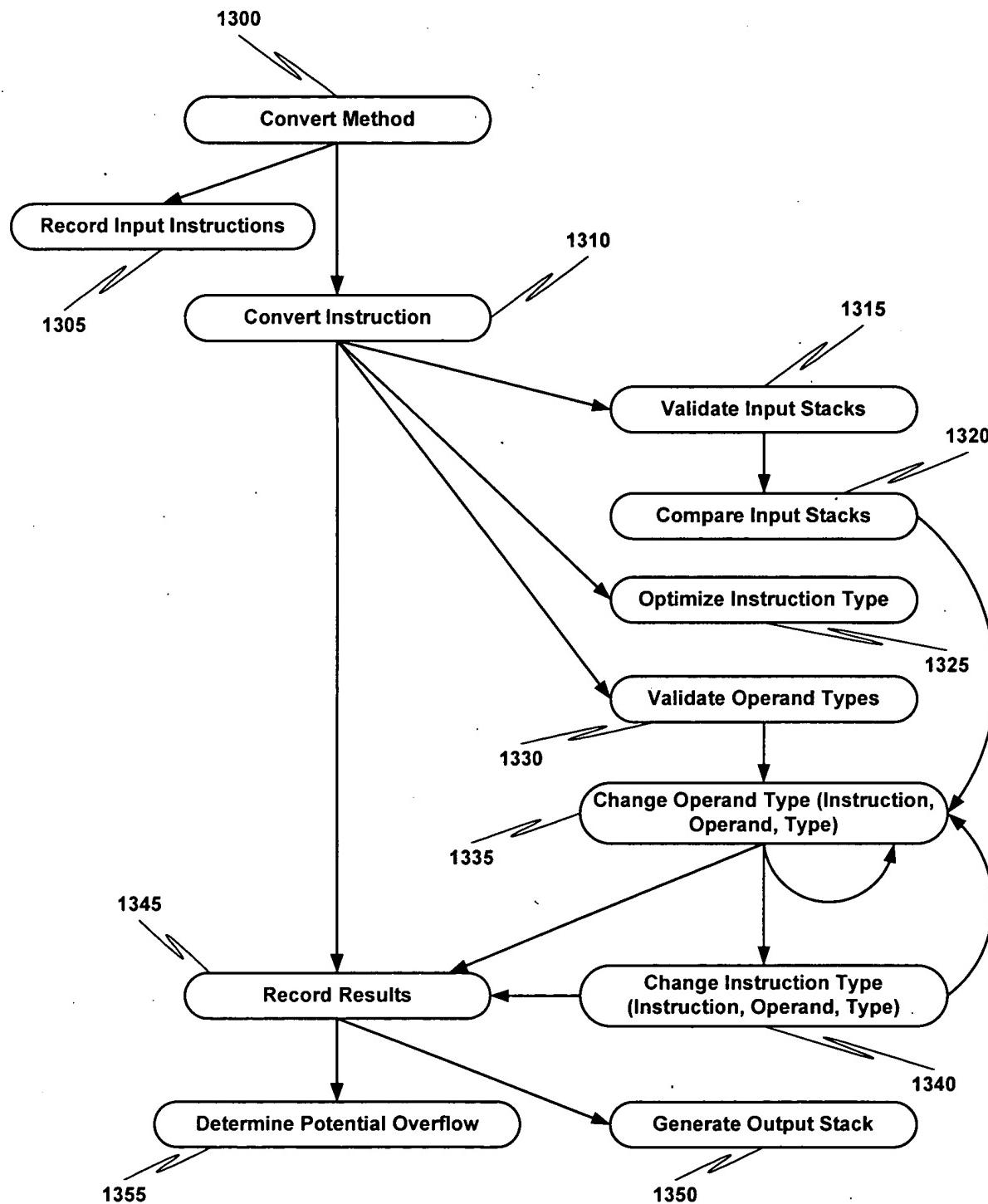


FIG. 13

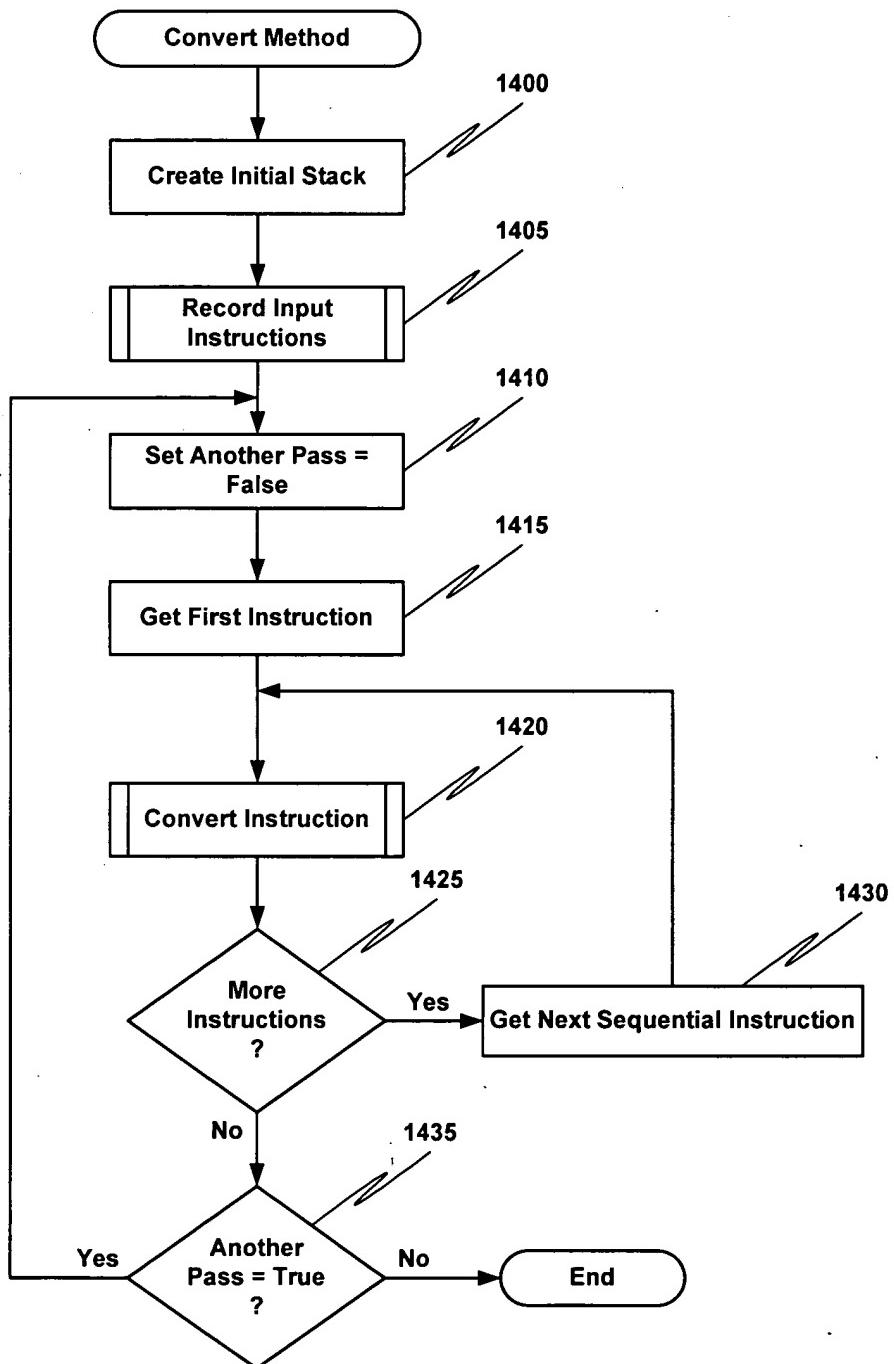


FIG. 14

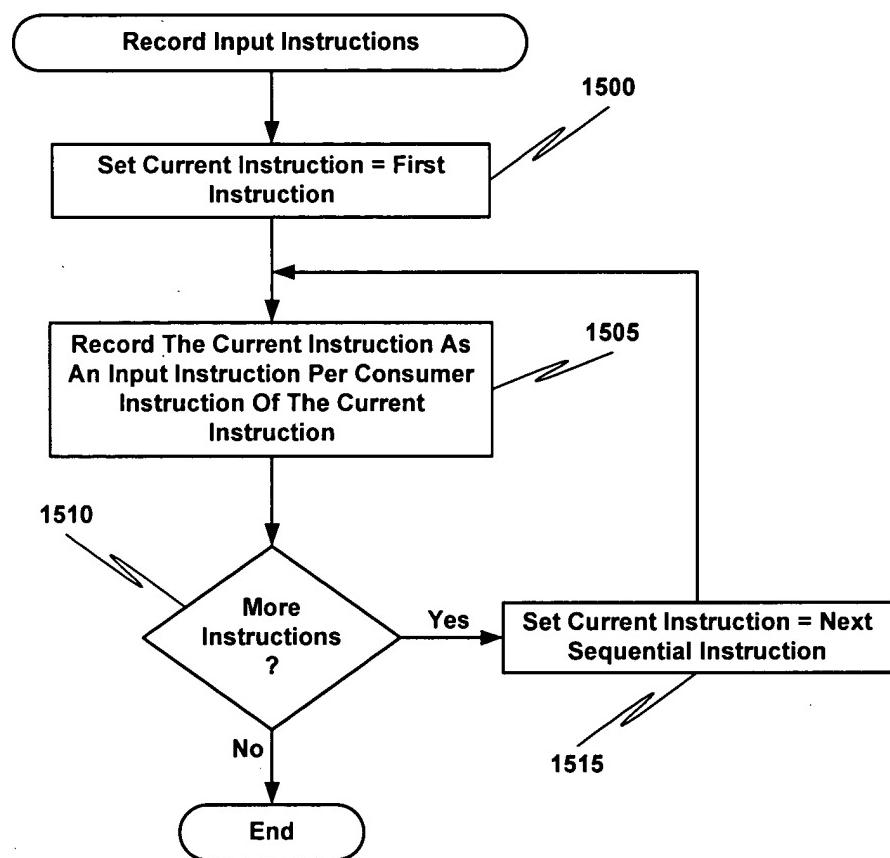


FIG. 15

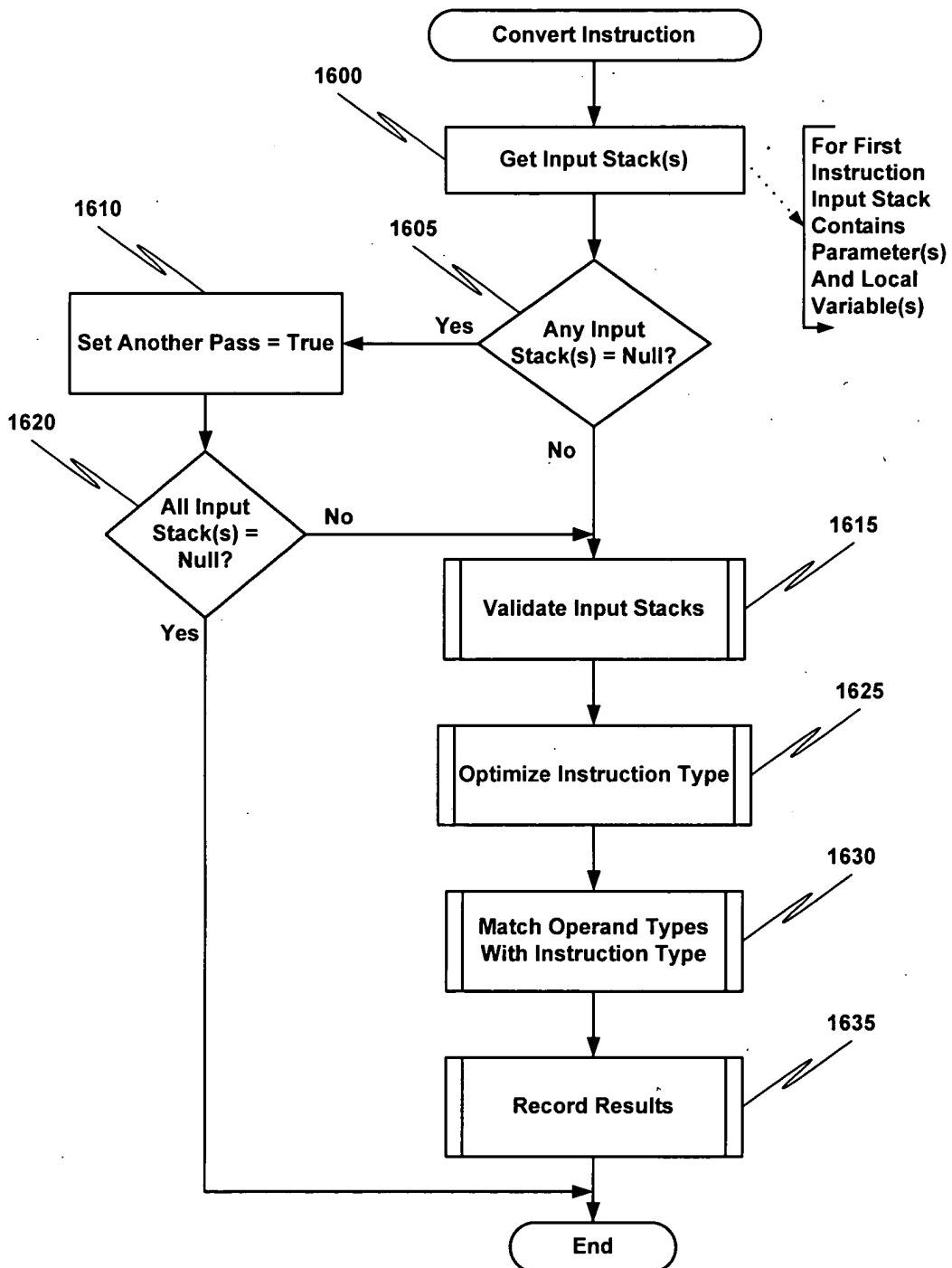


FIG. 16

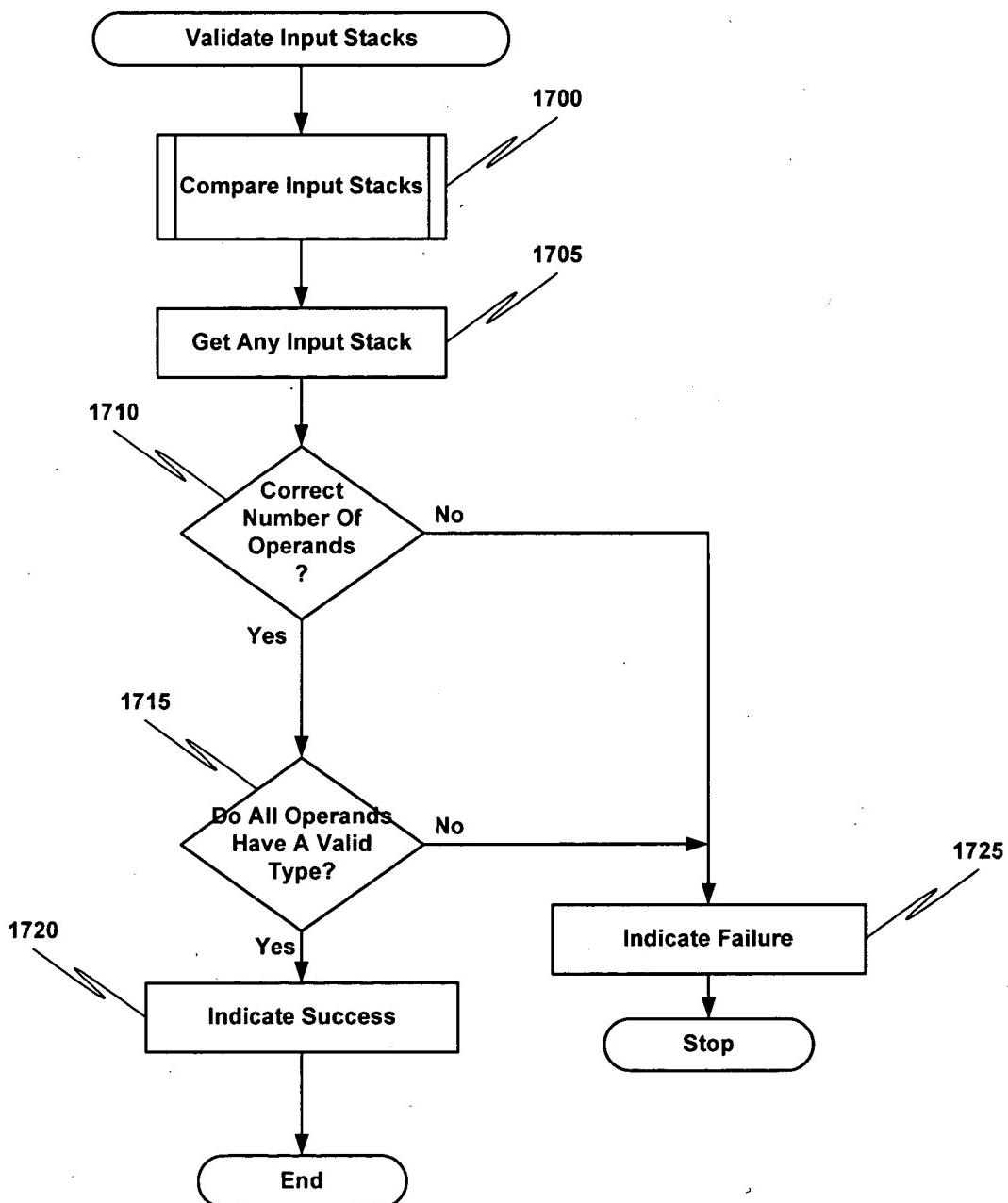


FIG. 17

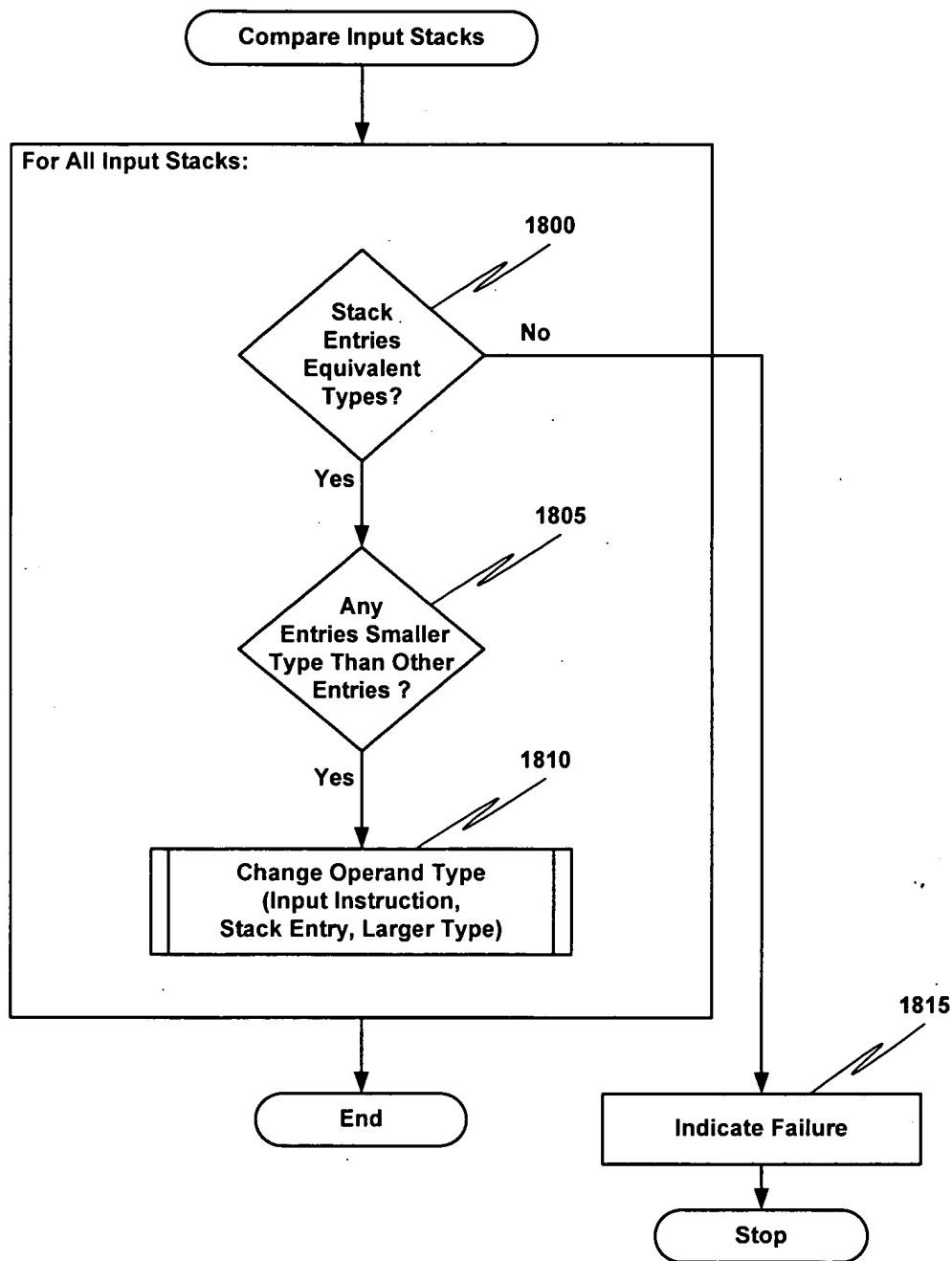


FIG. 18

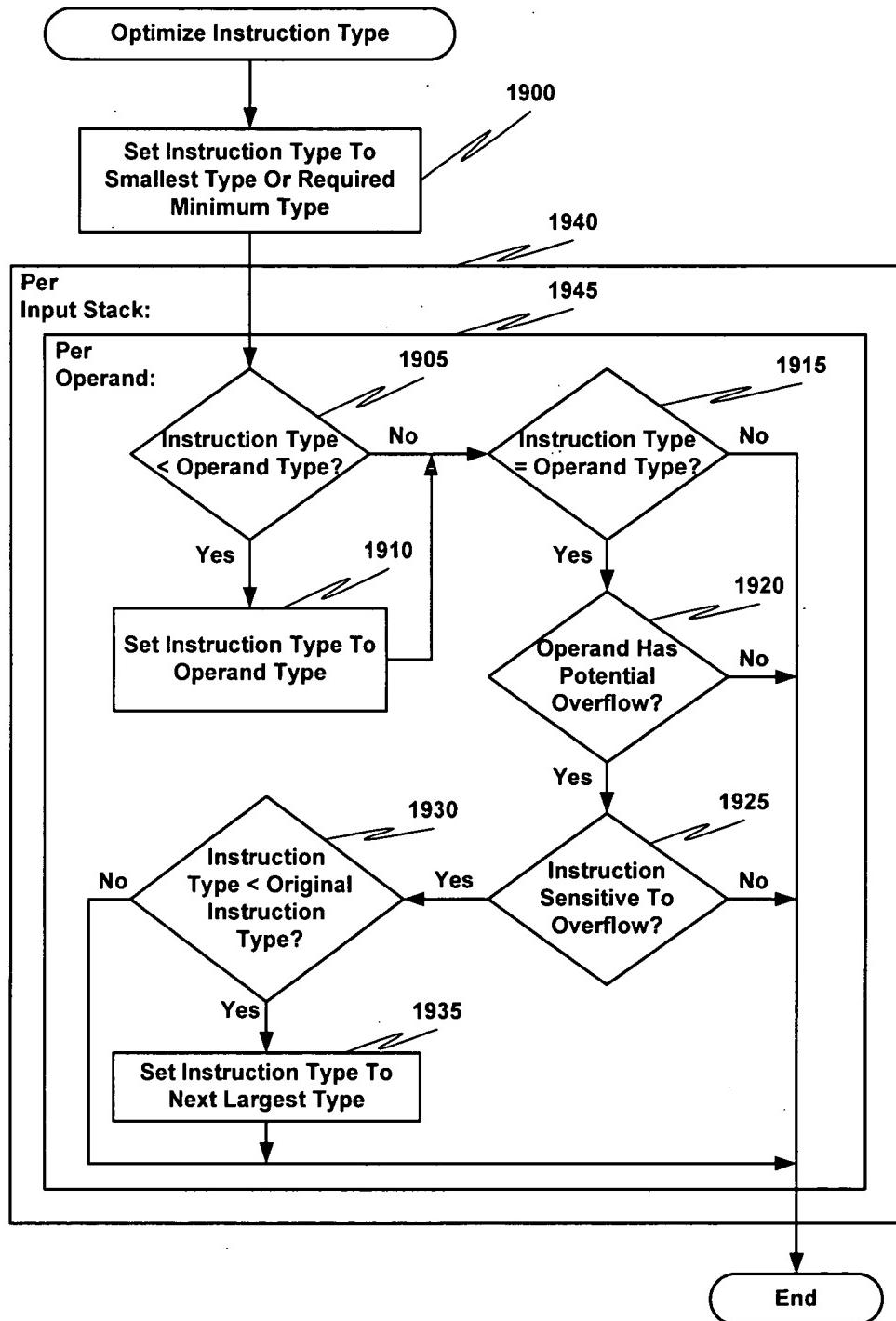


FIG. 19

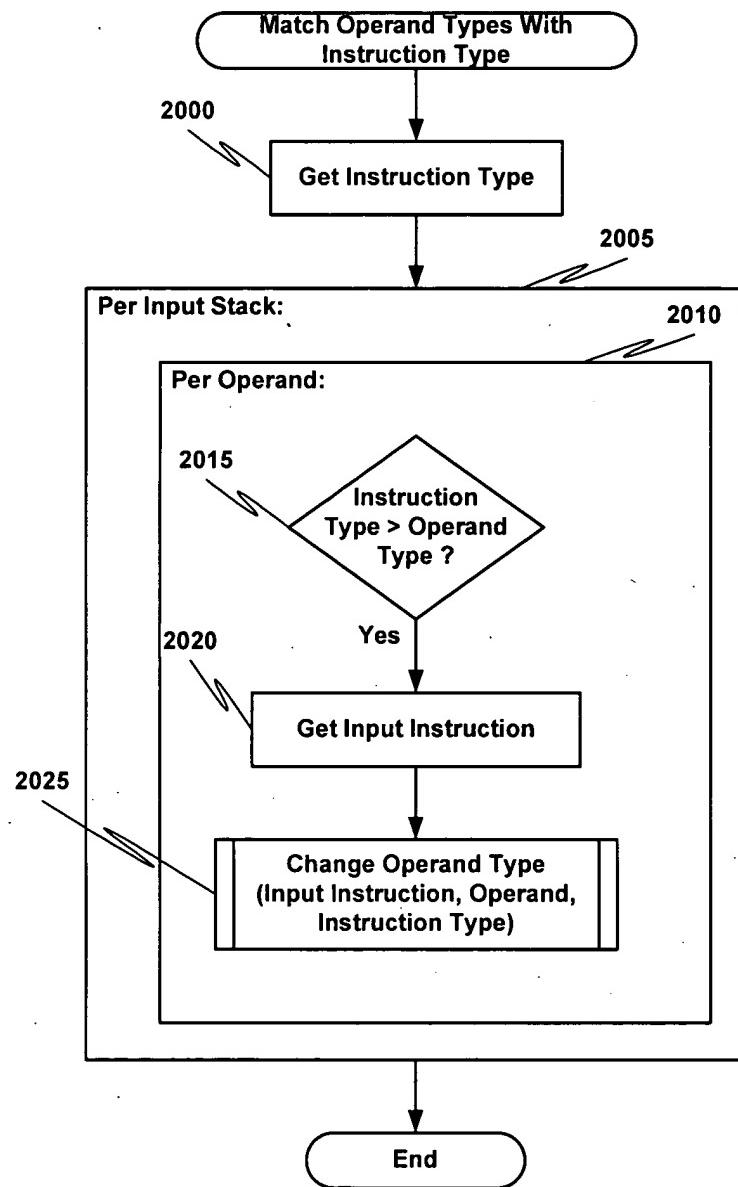


FIG. 20

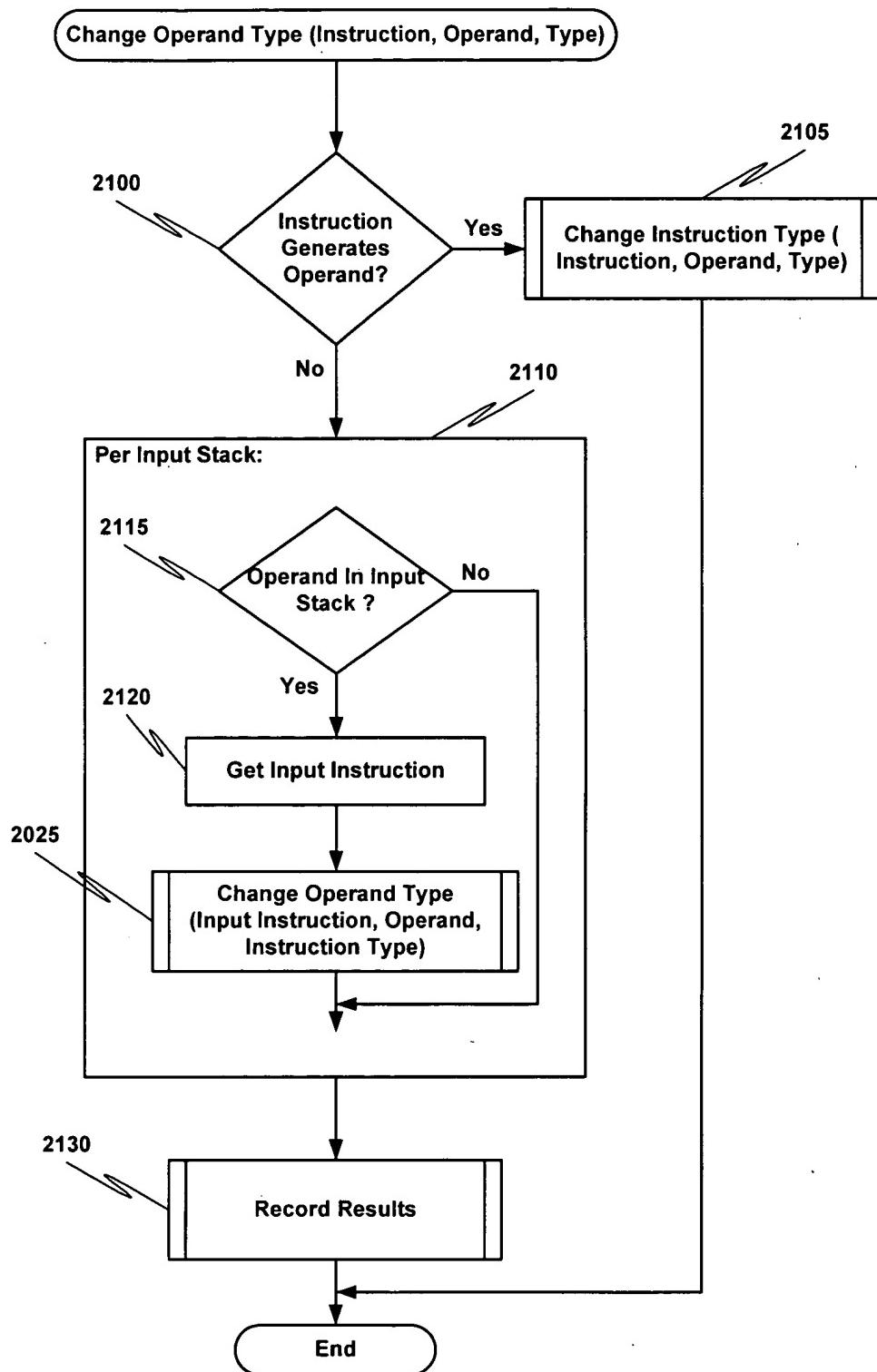


FIG. 21

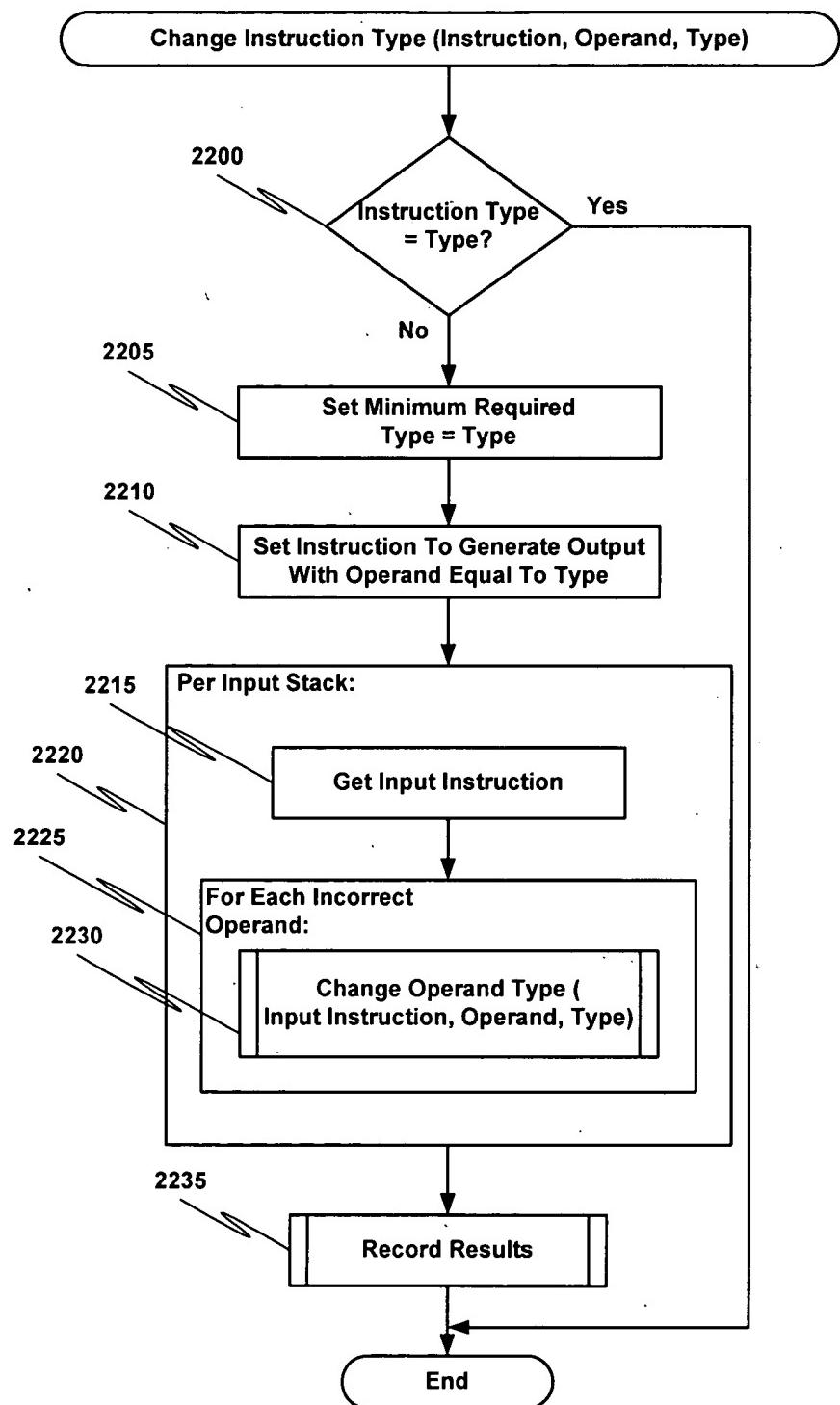


FIG. 22

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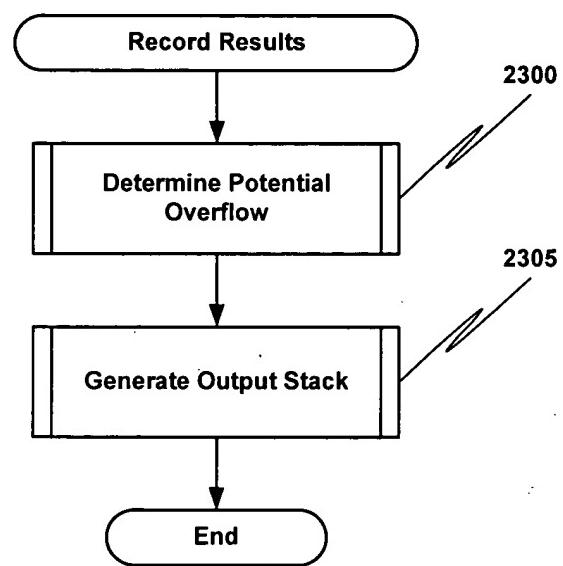


FIG. 23

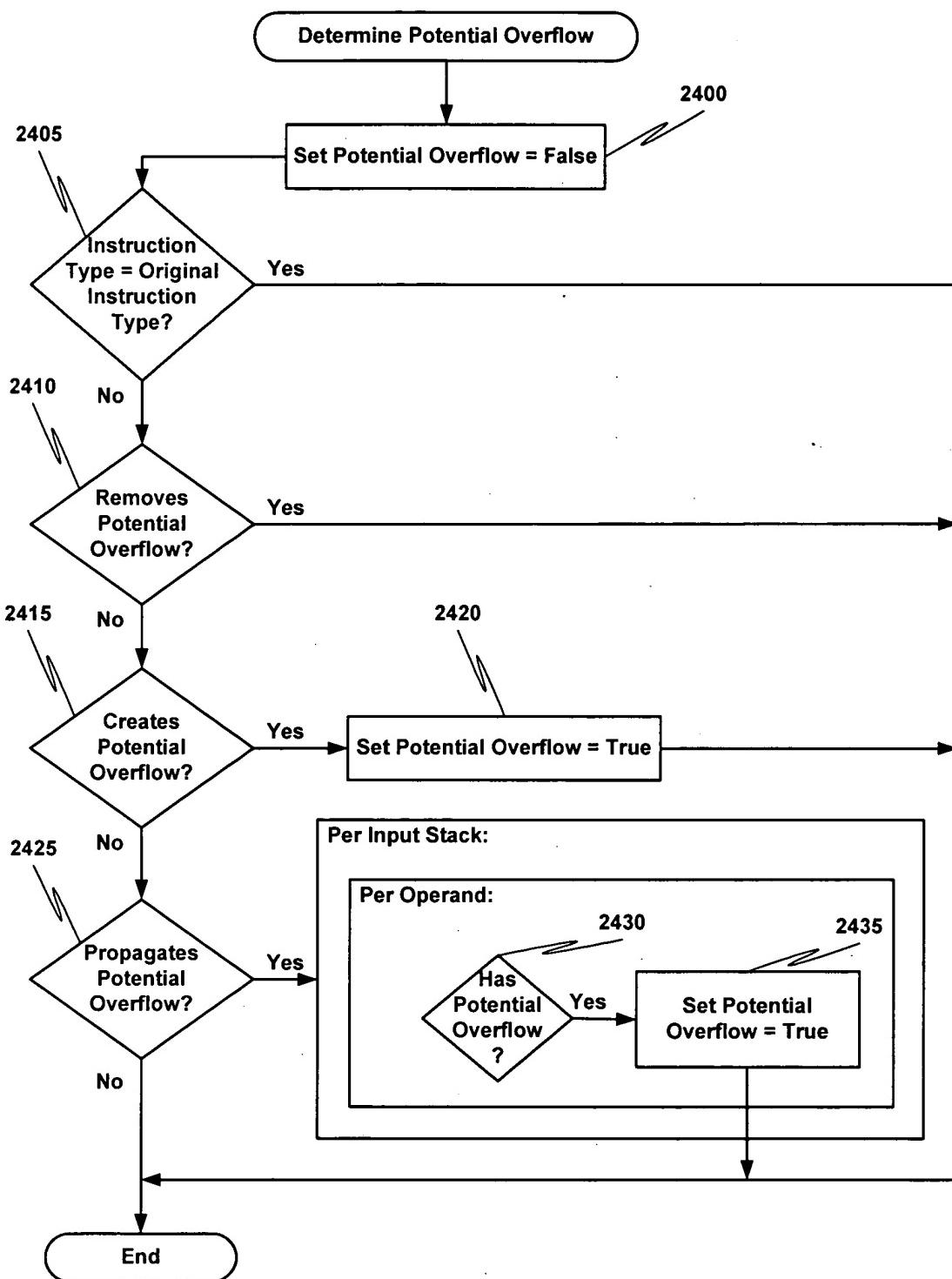


FIG. 24A

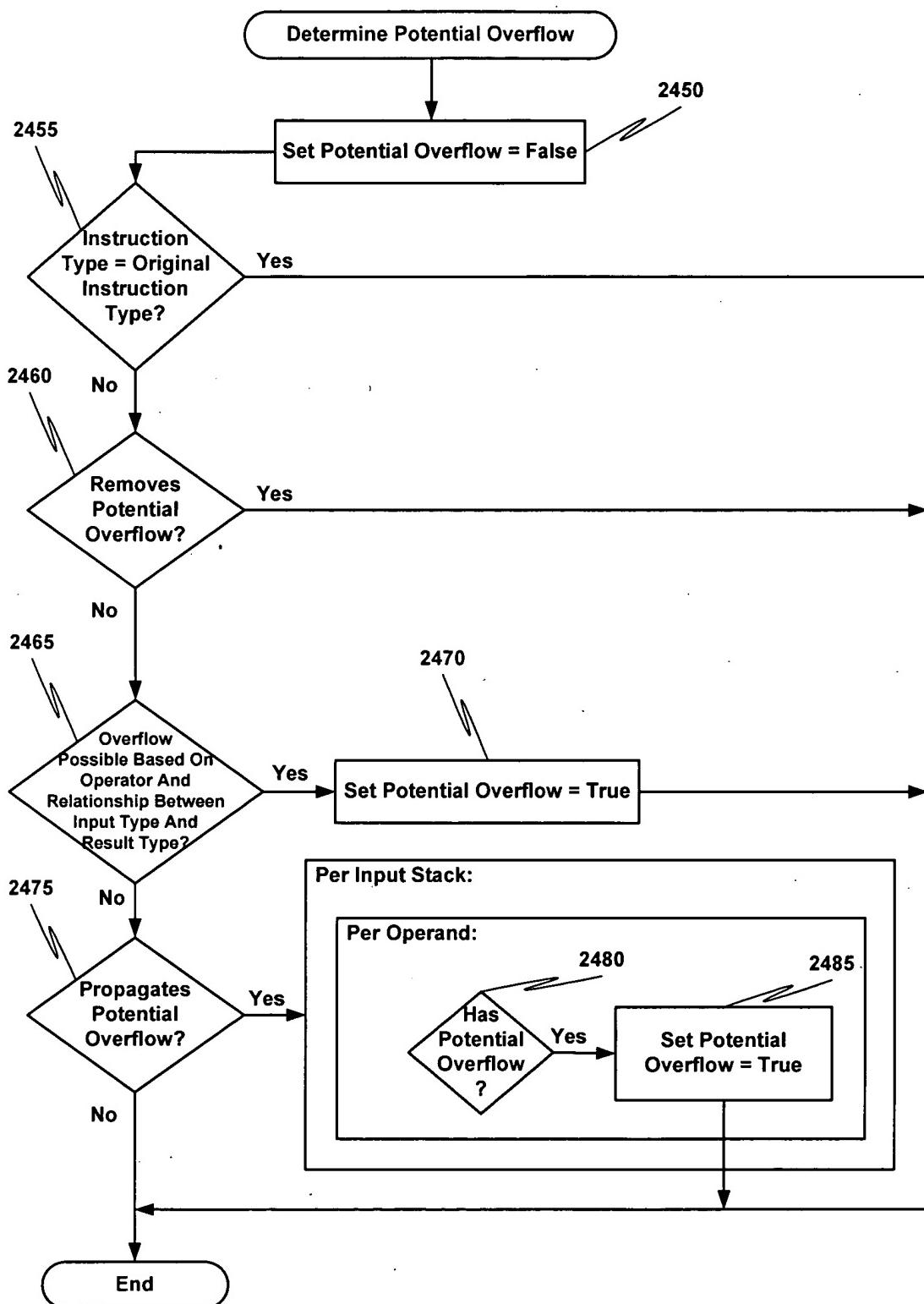


FIG. 24B

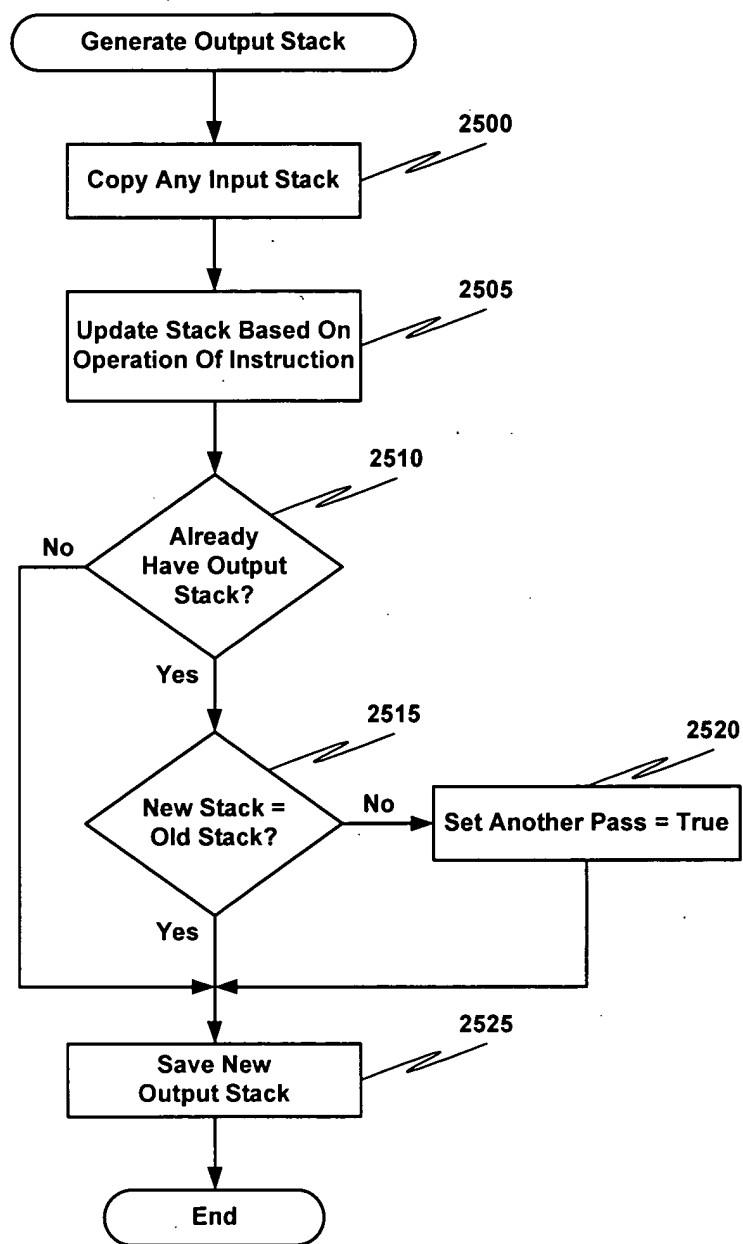


FIG. 25

Preconditions: Variables "a", "b" and "c" are declared as type "short"

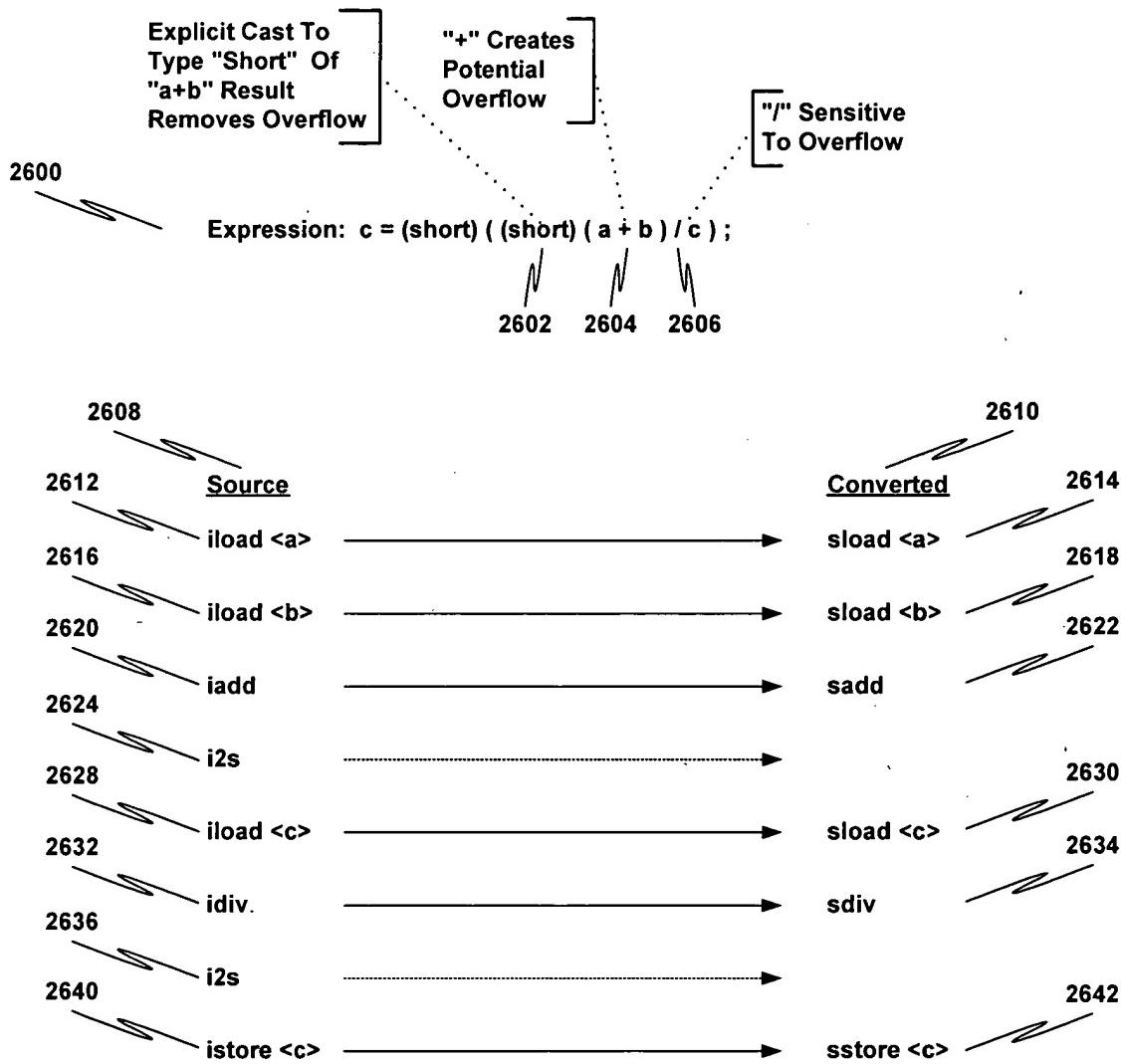


FIG. 26

Preconditions: Variables "a", "b" and "c" are declared as type "short"

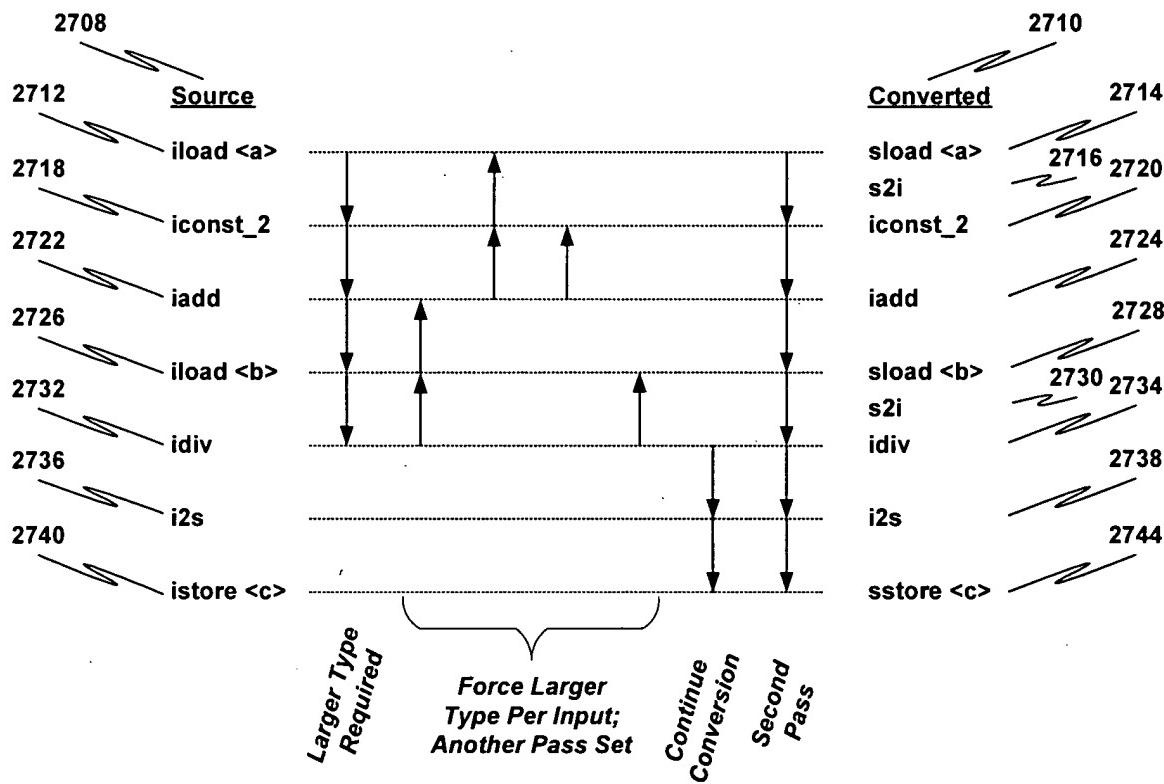
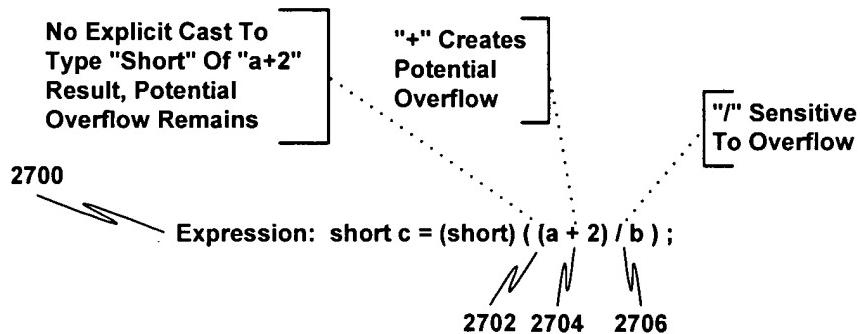


FIG. 27

Preconditions: Variables "a", "b" and "c" are declared as type "short"

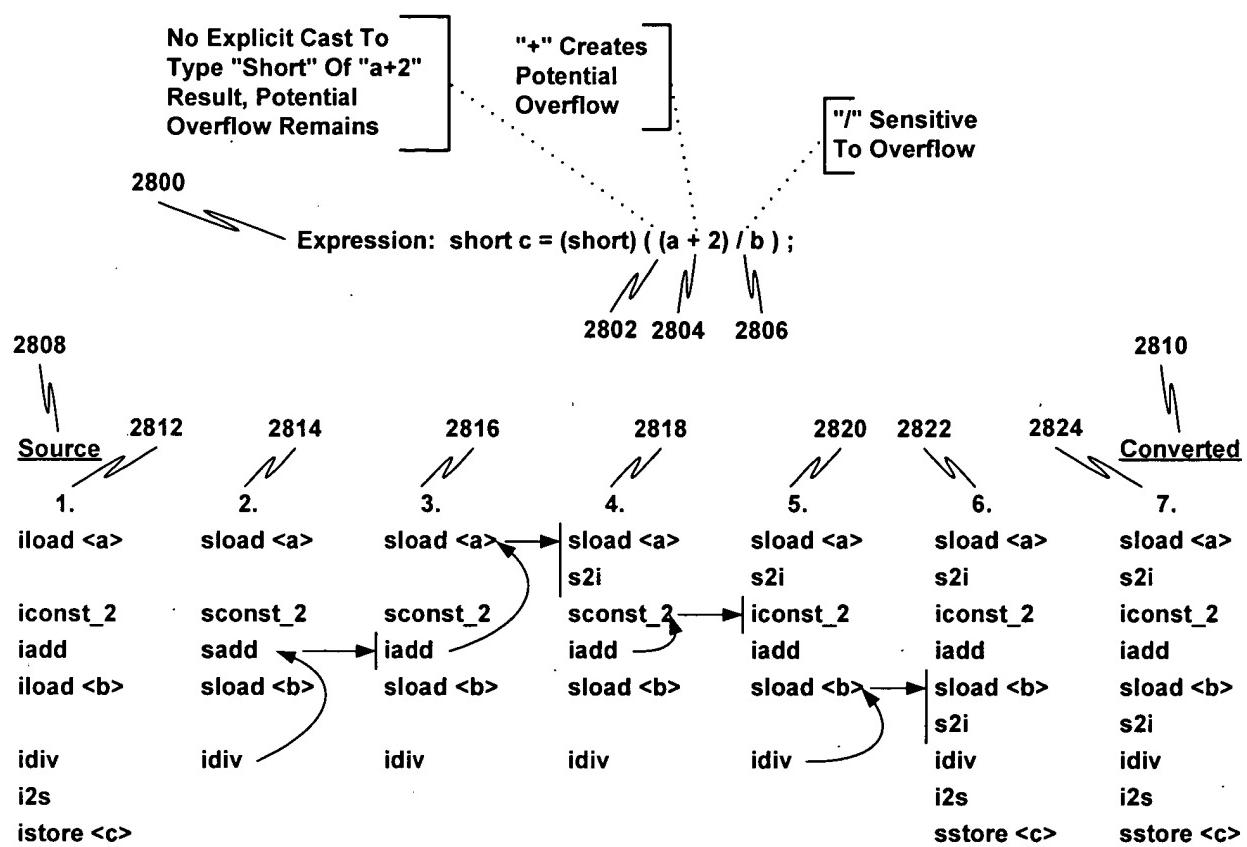


FIG. 28

Preconditions:

Variables "x", and "b" are declared as type "short"
 Variable "a", "c", and "d" are declared as type "int"

Source code:

```
if ( x != 0 )
    d = a + b;
else
    d = a + c;
```

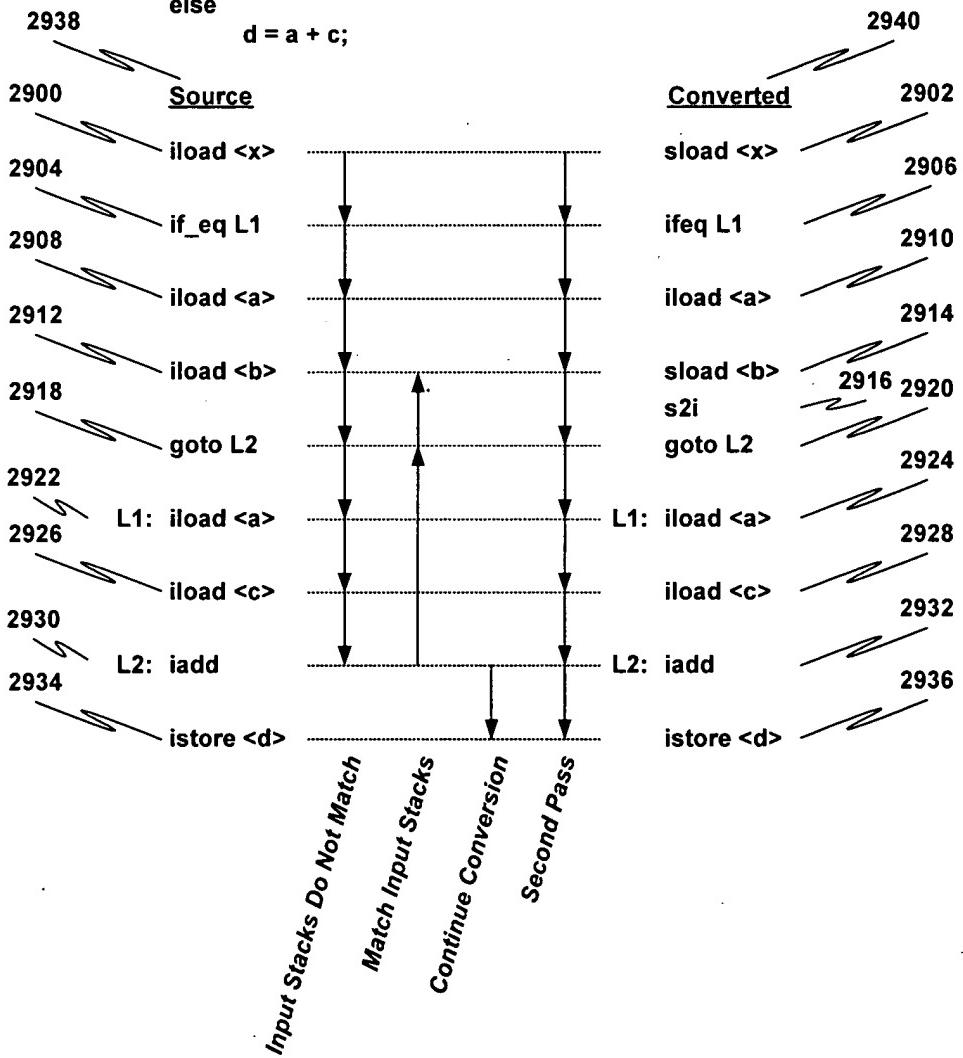


FIG. 29

Preconditions:

Variables "x", and "b" are declared as type "short"
 Variable "a", "c", and "d" are declared as type "int"

Source code:

```
if ( x != 0 )
    d = a + b;
else
    d = a + c;
```

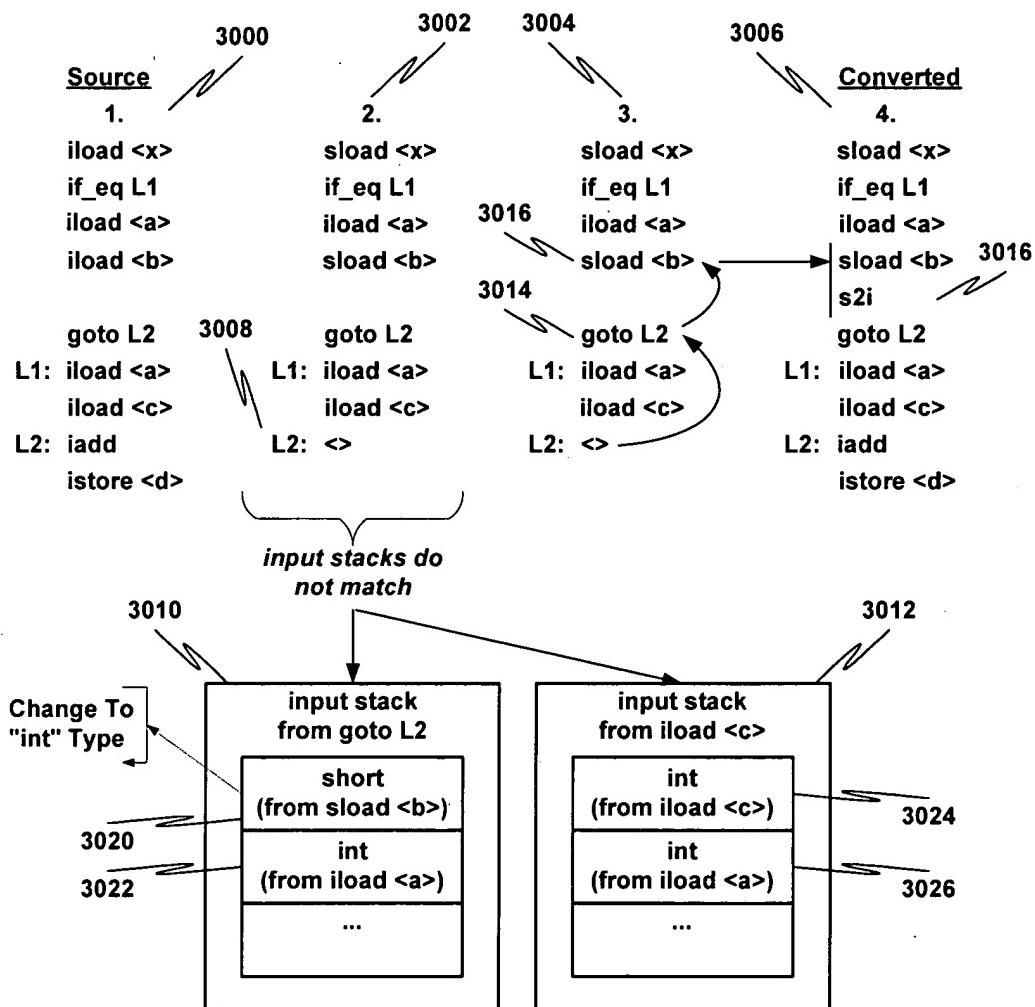


FIG. 30

Preconditions:

Variables "a", "b" and "c" are declared as type "short"
 Variable "d" is declared as type "int"

Source Code:

```
c = (short) (a * b);
d = b + d;
```

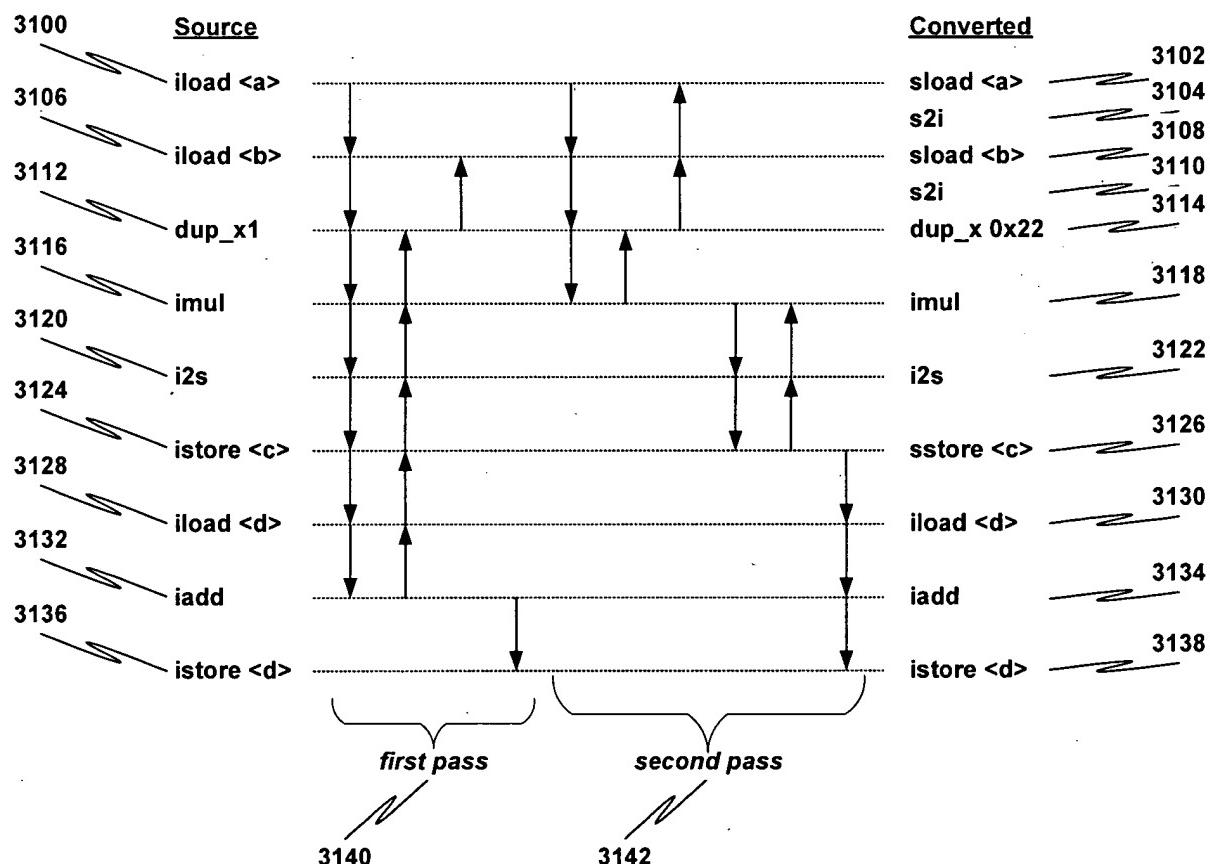


FIG. 31

Preconditions: Variables "a", "b" and "c" are declared as type "short"
Variable "d" is declared as an type "int"

```
Source Code:  
c = (short) (a * b);  
d = b + d;
```

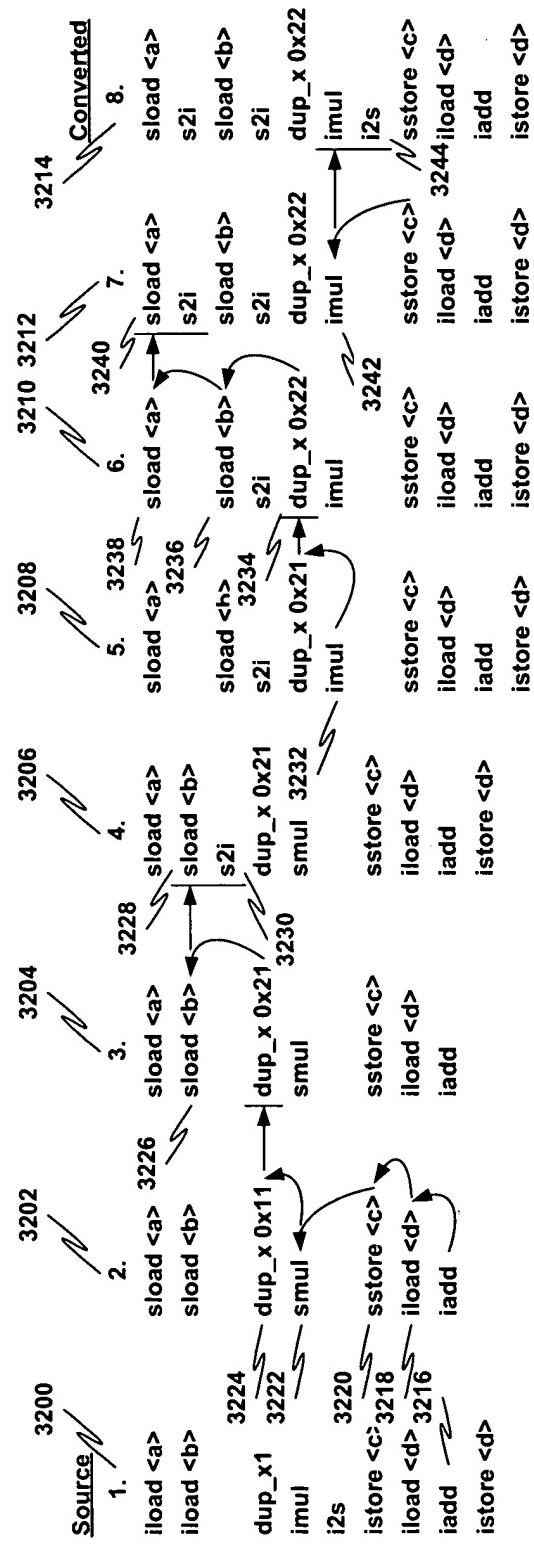


FIG. 32